

REMARKS

This is a response to the non-final Office Action mailed December 29, 2004. Claims 1-160 are cancelled without prejudice and new claims 161-164 are added.

In the Office Action, the Examiner required affirmation of the provisional election. Applicant affirms the election of Group 1, claims 1-8, 20-62, 104-111, 119-123 and 129-130. It is respectfully submitted that new claims 161-164 are consistent with the Examiner's definition of Group 1, since independent claim 161 incorporates subject matter from original claim 6 (which is included in Group 1). Further, Applicant does not traverse the restriction requirement.

The Examiner also rejected claim 52 under 35 U.S.C. 112, first paragraph; rejected claims 1-5, 7-8, 20-24, 28-31, 35-41, 44-50, 61, 104-108 and 119-122 under 35 U.S.C. 102(b) as being anticipated by Jurgensen; rejected claims 20-24, 29, 35-39, 46-49, 51-52, 104-106, 119-120 and 123 under 35 U.S.C. 102(b) as being anticipated by MacLeish; rejected claims 25-27 and 32-34 under 35 U.S.C. 103(a) as being unpatentable over Jurgensen in view of Ikeda; rejected claims 6, 53-60, 109-111 and 129-130 under 35 U.S.C. 103(a) as being unpatentable over Jurgensen in view of Hirooka; rejected claims 42-43 under 35 U.S.C. 103(a) as being unpatentable over Jurgensen in view of Ikeda; and rejected claim 62 under 35 U.S.C. 103(a) as being unpatentable over Jurgensen in view of Fujii.

In his rejection of claim 6 (which contains subject matter in common with new independent claim 161) under 35 U.S.C. 103(a) as being unpatentable over Jurgensen in view of Hirooka, the Examiner stated that "Jurgenson et al do not disclose the details of gas in structure for multiple chambers connected to same source for increase throughput," but that "Hirooka et al disclose a continuous deposition system having multiple chambers connected in parallel to a common source of gas . . ."

However, Applicant respectfully submits that the device disclosed by Hirooke is substantially different from the claimed invention. It is important to appreciate that even though Hirooke uses multiple chambers, each chamber is depositing one and only one layer of the total structure that has multiple layers. That is, each chamber of the Hirooke device only forms a portion of the final multi-layer product. Thus, it is necessary to move wafers from one chamber to another when using the Hirooke device.

By way of contrast, each chamber of the claimed invention forms multiple layers. Thus, according to the present invention, a common reactant gas supply for the chambers is configured to provide substantially the same gas mixture to each chamber. Hirooke uses different gas mixtures for each chamber, so as to form the different layers in each chamber. It is not necessary to move wafers from one chamber to another according to the claimed invention.

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One advantage of the present invention is the ability to scale up production via the addition of more chambers to an existing gas inlet and outlet system. This advantage is lost according to the configuration disclosed by Hirooke. Moreover, Hirooke is not trying to solve a "scaling-up" problem and the architecture of the apparatus is simply not the same as in the claimed device.

More particularly, by using multiple chambers, the claimed invention eliminates the need for a larger size chamber, which is especially hard to use for GaN material growth that requires high temperature and high flow of corrosive ammonia gas. When using larger sized chambers for increased throughput in a CVD system, the process and hardware designs need to be re-established every time there is a size change. The development time is usually very long, several years. The history of GaN reactor size tells us it took about eight years for it to evolve from six wafers to twenty-one wafers throughput due to the complex process development associated with each size change. According to the claimed invention, the process does not change since the chamber size does not change. The scale up is almost unlimited. There is no need to transfer substrates from one chamber to another. Each chamber is completely isolated without inter-communication. Thus, the present invention provides substantial advantages over the prior art.

It is respectfully submitted that none of the cited references, take either alone or in combination with one another either disclose or make obvious "a common reactant gas supply for the chambers configured to provide substantially the same gas mixture to each chamber."

Support for this limitation is provided from page 23, paragraph 00118 to page 24, paragraph 00121 and Figure 10 of the specification as originally filed. It is respectfully submitted that no new matter has been added. It is clear from Figure 10 that substantially the same gas mixture is being provided by common reactant gas supply or inlet system 960 to each chamber.

It is respectfully submitted that the dependent claims are independently patentable with respect to the independent claim. For example, new dependent claim 163 recites "wherein each chamber is a comparatively small chamber" and new dependent claim 164 recites "wherein each chamber defines a seven wafer reactor." Both of these claims limit the size of the reactor to a size that is comparatively small. As stated in the specification of the subject patent application, small reactors have better hardware reliability, especially for group III nitride growth, since smaller mechanical parts have lower stress at high temperatures (page 23, paragraph 00119). Also, growth consistency is better achieved with smaller reactors, since temperature and flow dynamics are much easier to maintain than in larger reactors (page 24, 00120). Other advantages of smaller reactors are discussed on page 24, paragraphs 00120 and 00121.

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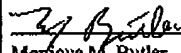
CONCLUSION

In view of the foregoing, it is respectfully submitted that claims 161-164 of the subject patent application are in condition for immediate allowance. Reconsideration and an early allowance is therefore respectfully requested.

If the Examiner has any questions or concerns, a telephone call to the undersigned at (949) 752-7040 is welcomed and encouraged.

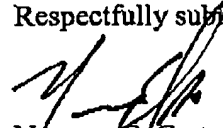
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June 28, 2005
Date of Signature

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